

when the CCD line sensor does not read the black reference data; thus, a DRAM is used for the FIFO memory M2 as well.

#### Detailed Description Text - DETX (61):

Furthermore, when summing up the black reference data in 8 bit region; the lower 5 bits of the FIFO memory M2 are read in the 8 bit region and summation is performed in the 8 bit region and then upper 5 bits are brought back to the lower 5 bits of FIFO memory M2. Thus after the summation of the eight black reference data corresponding to eight lines, without performing the division by 8, what is in the lower 5 bit region of the FIFO memory M2 is the average value of the black reference data. Thus it can simplify the memory structure and its associate parts.

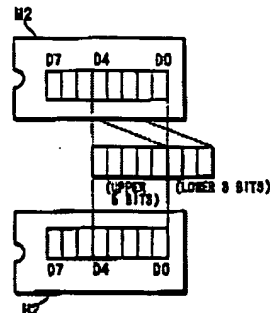
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13	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 5943141 A	19990824
14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5940192 A	19990817

BIT STRUCTURE OF  
ADDITION UNIT G5  
(TOTAL 8 BITS)

AVERAGE VALUE OF  
8 LINES



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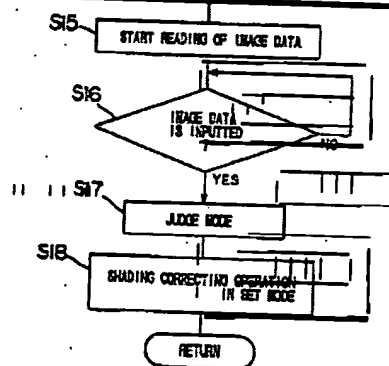
# Detailed Description Text - DETX (51):

In setting the black reference value and the white reference value, it is preferable to incorporate not only data corresponding to one line but also data corresponding to a plurality of predetermined lines, for example, eight lines by the line CCD 26, find the average value of the data for each pixel, and compare the average value with BMIN or WMAX1 held in the register 35. The reason for this is that the black reference value and the white reference value are stabilized by using the average value of the line data.

## Detailed Description Text - DETX (52):

After the black reference value and the white reference value are produced in the above described manner, image data is read, and the read image data is subjected to shading correction using the foregoing expression (2), for example

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4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5189528 A	19930223
5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EP 529193 A	19930303



# Detailed Description Text - DETX (4):

Referring to FIG. 3, a dot-sequential sensor array 1 comprises photo sensors 1R, 1G, 1B of three colors R, G, B each having a corresponding color filter (not shown) sequentially and repeatedly arranged at the unit of pixels in a one-dimensional fashion. The dot-sequential sensor array 1 is divided to provide an effective pixel region 2 which photoelectrically converts an incident light from the outside by the respective photo sensors 1R, 1G, 1B to obtain an image information and a reference pixel region 3 known as an optical black (OPB) region for detecting a reference level, e.g., black level (0 level) of an image information. Then, the reference pixel region 3 can receive a light of only one pixel e.g., red pixel (R).

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on next page.)

H. Lee  
J. & Simpson

RACT

ed to a color linear sensor of accurately measure a degree of tion. In a color linear sensor array (1), only one pixel of a reference pixel region (3) is light. Then, a degree of color isolating a level difference a pixel and a signal output of hat of the former pixel in an o, the present invention is to which can prevent sensors from ther in position, simplify a eruit and which can prevent a ed by signal charges deterior d by a transfer register. In a x-sequential sensor array (1), med as two-stage configura- tion for sequentially reading out signal charges from respec- tive sensors (1R), (1G), (1B) of the dot-sequential sensor array (1) to a CCD register (23) at the unit of pixels, thereby to sequentially output signal charges of one line at every color in a line-sequential fashion.

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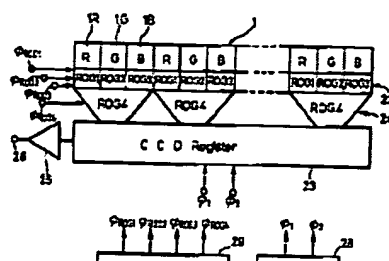
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7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5422670 A	19950606

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4,581,651 4/1986 Miyata et al. .... 358/213.26  
4,630,121 12/1986 Suzuki et al. .... 348/245  
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(List continued on next page.)

12 Claims, 5 Drawing Sheets



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shown in FIG. 11.

### Detailed Description Text - DETX (30):

In addition, though a weighting coefficient "k" of the recursive digital filter is set into "1/2" in this embodiment, an arbitrary value within a range of "0 < k < 1" can be set as the weighting coefficient "k". More specifically, though the clamp level of the first line is the reference level calculated from pixel data included in the line, each of the clamp levels at and after second line is a weighted average level of a clamp level of a preceding line and a newly obtained reference level with the coefficient "k". Accordingly, even if a noise is included at and after the second line of the front end OB level detection area, it is possible to reduce an influence of the noise on the image into "1/k".

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4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5596427 A	19970121
5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5585942 A	19961217
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US-PAT-NO: 6334002

DOCUMENT-IDENTIFIER: US 6334002 B1

TITLE: Image reader

DATE-ISSUED: December 25, 2

INVENTOR-INFORMATION:

NAME	CITY
Hashimoto; Nobuo	Ashiya
Ishii; Toru	Hiraka
Nakamura; Kenji	Takats

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6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6151419 A	20001121
7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6064494 A	20000516

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**FIG. 4**



two regions on the scanning initiation end side and on the scanning termination end side in the horizontal scanning direction orthogonal to the direction of conveyance of the record paper, and Fourier transforms sensor detection signals of the resist marks to detect for each color component the lateral line positions at two points on right and left sides and the slanted line positions at two points on right and left sides, to consequently detect on the basis of the four detection points correction values .DELTA.x in the horizontal scanning direction, correction values .DELTA.y in the vertical scanning direction and skew correction values .DELTA.z relative to the black reference of the other color components. The positional offset detection unit multiplies an average value of differences of right and left lateral line positions relative to right and left slanted line positions of black component with a conversion ratio (Ln/Ls) of a correction unit amount Ln in the horizontal scanning direction to a sampling pitch Ls in the vertical scanning direction, to obtain an absolute position Xk for the black component in the horizontal scanning direction. That is,

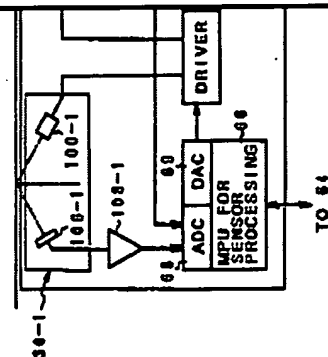
060 B1

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	U	1	Document ID	Issue Date
1	<input type="checkbox"/>	<input type="checkbox"/>	US 6549239 B1	20030415
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6473204 B1	20021029
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6417932 B1	20020709
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6334002 B1	20011225
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6321060 B1	20011120
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6151419 A	20001121
7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6064494 A	20000516

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FIG



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